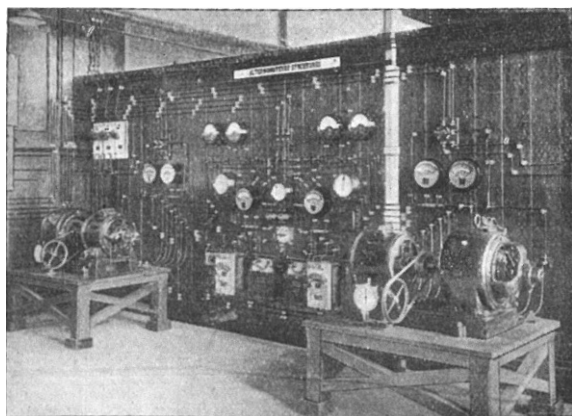


tions, one is struck by the excellence of the equipment of the laboratories and workshops. We reproduce on a reduced scale an illustration showing the installation for the study of synchronous motors and problems connected with the paralleling of alternators. The character of the wiring is a noticeable feature; the switchboard looks more like a diagram than an actual board, having all the leads plainly visible and easily accessible, which must prove a considerable advantage in teaching and experimental work. The apparatus and machinery installed cover practically the whole field of electrotechnical measurements, a separate



One of the laboratories at the Montefiore Institute.

installation, complete in itself, being provided for the study of each branch. In addition to these "industrial laboratories" there are well-equipped standardising laboratories, chemical and photometric laboratories, drawing offices, and lecture theatres. Altogether the institution appears to be thoroughly equipped for teaching electrical technology.

SOCIETIES AND ACADEMIES.

MANCHESTER.

Literary and Philosophical Society. October 6.—Prof. W. Boyd Dawkins, president, in the chair.—Dr. Henry **Wilde**, F.R.S., read a paper on the resolution of elementary substances into their ultimates and on the spontaneous molecular activity of radium. The author referred to several of his papers published by the Society on the genesis of elementary substances and on the multiple proportions of their atomic weights, wherein certain gaps appeared in the several series in his tables, which have since been filled up by scandium, germanium, helium, argon, neon, krypton and xenon. The remarkable properties of radium were held to represent further realisations of the predictions made in the author's earlier papers. The author had previously indicated the interruption in the regularity of his multiple series H_{2n} through the absence of elements of atomic weights 160 and 184 respectively. As there is only one place vacant higher in this series for an analogue of calcium, strontium and barium, radium was identified by the author as the tenth elementary condensation of H_{2n} , with an atomic weight of 184, and a specific gravity of 4.8, as shown in his tables. The author had shown in former papers that helium was the unknown typical molecule of the same series, with an atomic weight of 2, and had previously indicated the probability of the resolution of the higher members of each series into their elementary typical molecules. The production of helium from radium by Profs. Rutherford, Soddy and Ramsay confirmed the author's prevision in the case of the series H_{2n} , and this result may lead to the resolution of the higher members of other series into their ultimates.—Fossil plants from the Ardwick series of Manchester, by Mr. E. A. Neville **Arber**. The author has carefully reinvestigated the fossil plants from the Ardwick series of rocks collected by the late Mr. Binney, and which are now in the University Museum of Cambridge. He has also examined the numerous fossil plants from this series in the Manchester Museum, and has come to the con-

clusion that the Ardwick series of rock does not belong, as stated, to the Upper Coal-measures, but forms a definite transition series between the Upper and Middle Coal-measures of Lancashire. Such a transition series has been already recognised in the Coal-measures of South Wales, Somerset, and Staffordshire.

October 20.—Prof. W. Boyd Dawkins, president, in the chair.—Mr. Henry **Sidebottom** read a paper on recent Foraminifera from the coast of the island of Delos, in which he enumerated some seventy species of Miliolidae, including four new species and several interesting variations. The new species and variations were fully described, and drawings both of the specimens and their sections exhibited. Mr. Sidebottom stated that the dredgings from this locality were extraordinarily rich in Foraminifera.

PARIS.

Academy of Sciences, October 19.—M. Albert Gaudry in the chair.—On the state of vaporised carbon, by M. **Eerthelot**. At a temperature of 1200° – 1500° , carbon possesses an appreciable vapour pressure, which is so small that, even after several hundred hours in a vacuum, the amount vaporised amounts only to a few milligrams. This carbon is amorphous, and contains no trace either of diamond or graphite.—On the periods of double integrals and their relations with the theory of double integrals of the second species, by M. Émile **Picard**.—On the estimation of argon in atmospheric air, by M. Henri **Moissan**. Pure metallic calcium, prepared by a method previously described by the author, is used to absorb the nitrogen; this metal also absorbs the traces of hydrogen which are always present if a mixture of lime and magnesium powder has been used in the preliminary treatment. Samples of air from various sources gave, with one exception, very concordant figures between 0.931 and 0.938 per cent. by volume, the exception being a sample of air taken on the Atlantic, which gave 0.949 per cent.—On the products of condensation of tetramethyldiamidophenylloxanthranol with benzene, toluene, and dimethylaniline, by MM. A. **Haller** and A. **Guyot**.—On the acclimatisation and culture of pintadines, or true pearl oysters, on the coasts of France, and on the forced production of fine pearls, by M. Raphaël **Dubois**. Successful experiments have been carried out with *Margaritifera vulgaris*, which has been acclimatised and made to yield pearls which, although small, are of good quality.—On linear equations of finite differences, by M. Alf. **Guldberg**.—On a reflection refractometer, by M. Th. **Vautier**. An interference refractometer composed of three mirrors is described, allowing of the complete separation of the two interfering light bundles.—On the composition of zinc peroxide, by M. **Kuriloff**. The only definite peroxide of zinc appears to be $ZnO_2 \cdot Zn(OH)_2$.—The phagocyte organ of the crustacean decapods, by M. L. **Cuénot**.—On the phases of folding in the French intra-alpine zones, by M. W. **Kilian**.—The part played by compression in the localisation of the tendons, by M. R. **Anthony**.—On the relations existing between the Surra and the Nagana, according to an experiment of Nocard, by MM. **Vallée** and **Carré**. The authors confirm the views of MM. Laveran and Mesnil as to the non-identity of Surra and Nagana.—Parthenogenesis and treatment of rheumatism, by M. L. **Pénières**.—Experimental researches on the sense of smell in the old, by M. **Vaschide**. In old people the sense of smell is better preserved in women than in men, but in all cases there is a marked diminution in olfactory sensibility due to age.

NEW SOUTH WALES.

Royal Society, August 5.—Mr. F. B. Guthrie, president, in the chair.—The economic effects of sanitary works, by Mr. J. Haydon **Cardew**. The principal object of the paper was to give municipal and health authorities some basis to work upon in devising sanitary services and forecasting their economic effects.—On the protection of iron and other metal-work, by Mr. William M. **Hamlet**. The author dealt with an investigation of the causes of the rapid rusting away of the iron casing at one of the Australian artesian bores, where abundance of carbonic acid gas was evolved at 100° F.; the water also contained alkaline carbonates and bicarbonates with sodium chlorides, silica, &c., amounting to between thirty and forty grains of total solid matter to the gallon. Probably a specially hard and resistant alloy

will be required to stand the prolonged and severe action of the water in question.—On the elastic radial deformations in the rims and arms of flywheels, and their measurement by an optical method, by Mr. A. **Boyd**. In this paper actual measurements of the deflections of the rims during rotation were given, so that the shape of the rim at any speed within the elastic limit of the material could be seen. The flywheels tested were of different design. The curves for a curved armed wheel showed a large inflection between the arms, the maximum deflection being close to the arms. The tests on four armed wheels showed very clearly the great advantage of having the joint along the arms, the effect of the joint in a four-armed wheel, jointed along the arms, being in fact almost negligible.—The aboriginal fisheries at Brewarrina, by Mr. R. H. **Mathews**.

September 2.—Mr. F. B. Guthrie, president, in the chair.—The following papers were read:—The separation of iron from nickel and cobalt by lead oxide (Field's method), by Mr. T. H. **Laby**. An inquiry into the accuracy of Field's method, as it has distinct advantages over methods commonly in use, viz. a single precipitation of the iron, and the absence, after the removal of added lead, of all reagents, such as sodium or ammonium salts. Combined with the electrolytic determination of nickel or cobalt, the method becomes rapid. Standard solutions of carefully purified iron, nickel, and cobalt nitrates were prepared. With these solutions twenty-two analyses were made, showing a recovery of more than 99 per cent. of nickel and cobalt.—Pot experiments to determine the limits of endurance of different farm-crops for certain injurious substances, part ii., maize, by Messrs. F. B. **Guthrie** and R. **Helms**. The authors communicated the results of experiments having for their object the determination of the tolerance of maize for sodium chloride, sodium carbonate, ammonium sulphocyanide, sodium chlorate, and arsenious acid.—Bibliography of Australian lichens, by Mr. E. **Cheel**.—On the Narraburra meteorite, by Prof. **Liversidge**, F.R.S. A general account of the characteristics of this metallic meteorite, weighing more than 70 lb., which was discovered in 1855 on the Yeo Yeo Creek, twelve miles east of Temora, N.S. Wales.

Linnean Society, August 26.—Dr. T. Storie Dixon, president, in the chair.—Studies in Australian entomology. No. xii. New Carabidæ (Panageini, Bembidiini, Platysmatini, Platynini, Lebiini, with revisional lists of genera and species, some notes on synonymy, &c.), by Mr. T. G. **Sloane**.—Revision of the Australian Curculionidæ belonging to the subfamily Cryptorhynchides, part vi., by Mr. A. M. **Lea**.—Notes on *Byblis gigantea*, Lindl. [N.O. Droseraceæ], by Mr. Alex. G. **Hamilton**.

DIARY OF SOCIETIES.

SATURDAY, OCTOBER 31.

ESSEX FIELD CLUB, at 6.30.—Exhibition of a Series of Photographs of Fungi, by means of the Lantern: Mr. Somerville Hastings.—Seed Dispersal: Prof. G. S. Boulger.

MONDAY, NOVEMBER 2.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—On the Application of the X-Rays to the Examination of "Safety Fuses": C. Napier Hake.—Scarlet Phosphorus—A New Chemically Active Variety of Red Phosphorus, and its Use in the Manufacture of Matches: Drs. Marquart and Schulz.—New Compound of Phosphorus for the Production of Matches: F. Bale.—Densities of Concentrated Nitric Acid at different Temperatures: Prof. V. H. Veley, F.R.S., and J. J. Manley.—On a Comparison of Different Types of Calorimeters: J. S. S. Brame and Wallace A. Cowan.

TUESDAY, NOVEMBER 3.

ZOOLOGICAL SOCIETY, at 8.30.—On some New Species of Aquatic Oligochaeta from New Zealand: Prof. W. B. Benham.—List of the Mammals collected by Mr. A. Robert at Chapadã, Mato Grosso. (The Percy Sladen Expedition to Central Brazil): Oldfield Thomas, F.R.S.—List of the Coleoptera collected by Mr. A. Robert at Chapadã, Mato Grosso. (The Percy Sladen Expedition to Central Brazil): C. J. Gahan and G. J. Arrow.

WEDNESDAY, NOVEMBER 4.

GEOLOGICAL SOCIETY, at 8.—Metamorphism in the Loch Lomond District: E. H. Cunningham-Craig.—On a New Cave on the Eastern Side of Gibraltar: Henry Dyke Acland.

ENTOMOLOGICAL SOCIETY, at 8.—On some Aberrations of Lepidoptera: Percy I. Lathy.

SOCIETY OF PUBLIC ANALYSTS, at 8.—On the Salinity of Waters from the Oolites: W. W. Fisher.—Notes on (1) Some Indian Oils; (2) Differentiation of Linseed Oil from Boiled Oils: Dr. J. Lewkowitsch.—Note on the Purification of Hydrochloric Acid and Zinc from Arsenic: Dr. L. T. Thorne and E. H. Jeffers.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Northern Nigeria: Sir Frederick D. Lugard, K.C.M.G.
ENTOMOLOGICAL SOCIETY, at 8.

THURSDAY, NOVEMBER 5.

CHEMICAL SOCIETY, at 8.—Conductivity of Substances Dissolved in Certain Liquefied Gases. Preliminary Notice: B. D. Steele and D. McIntosh.—The Reduction of Hydrazoic Acid: W. T. Cooke.—The Behaviour of Metallic Oxides towards Fused Boric Anhydride: C. H. Burgess and A. Holt, Jun.—Some Reactions of Vanadium Tetrachloride: B. D. Steele.—Studies on Comparative Cryoscopy. Part I.: The Fatty Acids and their Derivatives in Phenol Solution: P. W. Robertson.—The Vapour Pressures of Sulphuric Acid Solutions. Preliminary Note: B. C. Burt.—The Viscosity of Liquid Mixtures. Preliminary Note: A. E. Dunstan and W. H. C. Jemmett.—Additive Compounds of s-Trinitrobenzene and Alkylated Arylamines: H. Hibbert and J. J. Sudborough.—A Contribution to the Study of the Reactions of Hydrogen Peroxide: J. McLachlan.—The Constitution of Certain Silicates: C. Simmonds.—Constitution of Ethyl Cyanacetate. Condensation of Ethyl Cyanacetate with its Enolic Form: P. Remfry and J. F. Thorpe.—Interaction between Chloric and Hydriodic Acids: J. McCrae.—3:5-Dichloro-1:1:2-Trimethyldihydrobenzene. A Correction: A. W. Crossley.—The Estimation of Hydroxylamine: H. O. Jones and F. W. Carpenter.—A Study of the Isomerism and Optical Activity of Quinquevalent Nitrogen Compounds: H. O. Jones.—The Action of Water and Dilute Caustic Soda Solutions on Crystalline and Amorphous Arsenic: W. T. Cooke.—The Union of Carbon Monoxide and Oxygen, and the Drying of Gases by Cooling: A. F. Girvan.

RONTGEN SOCIETY, at 8.30.—President's Address.

LINNEAN SOCIETY, at 8.—On the Structure of the Leaves of the Bracken, *Pteris aquilina*, in relation to environment: L. A. Boodle.—On the Life-history of a New Monophlebium from India, with a Note on that of a Vedalia predaceous upon it; with Remarks on the Monophlebinae of the Indian Region: E. P. Stebbing.

FRIDAY, NOVEMBER 6.

GEOLOGISTS' ASSOCIATION, at 8.—Conversazione at University College.

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